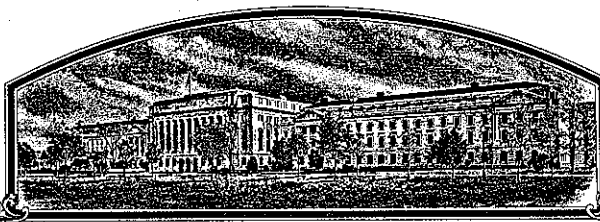


No.

8200162



# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

**Ring Around Products, Inc.**

Whereas, THERE HAS BEEN PRESENTED TO THE

**Secretary of Agriculture**

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'Mitchell 410'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington this 27th day of October in the year of our Lord one thousand nine hundred and eighty-three.

Attest:

*Kenneth H. Evans*

Commissioner  
Plant Variety Protection Office  
Grain Division  
Agricultural Marketing Service

*John R. Block*  
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
LIVESTOCK, MEAT, GRAIN & SEED DIVISION

FORM APPROVED: OMB NO. 0581-0055

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

1. NAME OF APPLICANT(S) <del>Zoecon Corporation</del> <sup>MS 6/25/85</sup> ROHM AND HAAS SEEDS INC.		2. TEMPORARY DESIGNATION RAX 24	3. VARIETY NAME Mitchell 410
4. ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code) <del>975 California Avenue</del> <del>P.O. Box 10975</del> <del>Palo Alto, California 94303</del>		5. PHONE (Include area code) <del>214-243-8166</del>	FOR OFFICIAL USE ONLY PVPO NUMBER 8200162
6. GENUS AND SPECIES NAME Glycine Max	7. FAMILY NAME (Botanical) Leguminosae		FILING DATE 8/24/82 TIME 12:30 <input type="checkbox"/> A.M. <input checked="" type="checkbox"/> P.M.
8. KIND NAME Soybean	9. DATE OF DETERMINATION May 1982		FEES RECEIVED AMOUNT FOR FILING \$ 500 DATE 8/24/82 AMOUNT FOR CERTIFICATE \$ 250.00 DATE 9/21/83
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation			12. DATE OF INCORPORATION March 26, 1975
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Delaware			
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS <del>Mike Haniford</del> <del>Ring Around Products, Inc.</del> <del>12000 Ford Road, Suite 300</del> <del>Dallas, Texas 75234</del> (214-243-8166) DR. JAMES E. STROIKE 727 NORRISTOWN ROAD, BUILDING 70 SPRING HOUSE, PA 19477			
14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED			
a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)		c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of the Variety (Request form from Plant Variety Protection Office.)	
b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement		d. <input checked="" type="checkbox"/> Exhibit D, Additional Description of the Variety	
15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act.) <input type="checkbox"/> Yes (If "Yes," answer items 16 and 17 below) <input checked="" type="checkbox"/> No			
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> Yes <input type="checkbox"/> No		17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input type="checkbox"/> Foundation <input type="checkbox"/> Registered <input type="checkbox"/> Certified	
18. DID THE APPLICANT(S) FILE FOR PROTECTION OF THE VARIETY IN THE U.S. OR OTHER COUNTRIES? <input type="checkbox"/> Yes (If "Yes," give names of countries and dates) <input checked="" type="checkbox"/> No			
19. HAVE RIGHTS BEEN GRANTED IN THE U.S. OR OTHER COUNTRIES? <input type="checkbox"/> Yes (If "Yes," give names of countries and dates) <input checked="" type="checkbox"/> No			
20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable. The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.			
SIGNATURE OF APPLICANT MS August, ASSISTANT SECRETARY		DATE 30. August. 82	
SIGNATURE OF APPLICANT		DATE 1	

## INSTRUCTIONS

**General:** Send an original copy of the application and exhibits, at least 2,500 viable seeds, and \$500 fee (\$250 filing fee and \$250 examination fee) to U.S. Department of Agriculture, Agricultural Marketing Service, Livestock, Meat, Grain and Seed Division, Plant Variety Protection Office, National Agricultural Library Building, Beltsville, Maryland 20705. (See section 180.175 of the Regulations and Rules of Practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

### Item

- 9 Give the date the applicant determined that he had a new variety based on (1) the definition in section 41(a) of the Act and (2) the date a decision was made to increase the seed.
- 14a Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method; (2) the details of subsequent stages of selection and multiplication; (3) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified and (4) evidence of uniformity and stability.
- 14b Give a summary statement of the variety's novelty. Clearly state how this novel variety may be distinguished from all other varieties in the same crop. If the new variety most closely resembles one or a group of related varieties: (1) identify these varieties and state all differences objectively; (2) attach statistical data for characters expressed numerically and demonstrate that these differences are significant; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty.
- 14c Fill in the Exhibit C, Objective Description form, for all characteristics for which you have adequate data.
- 14d Describe any additional characteristics that are not described, or whose description cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the description of characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 15 If "Yes" is specified (*seed of this variety be sold by variety name only as a class of certified seed*) the applicant may NOT reverse his affirmative decision after the variety has either been sold and so labeled, his decision published, or the certificate has been issued. However, if the applicant specified "No," he may change his choice. (See section 180.16 of the Regulations and Rules of Practice.)
- 16 See section 42 of the Plant Variety Protection Act and section 180.7 of the Regulations and Rules of Practice.

GPO 890-698

RECEIVED

SEP 7 1982



Exhibit A  
Origin and Breeding History of the Variety

SX-76 was the name given to the cross (Viking x Unk 286 dt<sub>1</sub>) x Mitchell made in 1975.

Viking was a Merit x Amsoy derived line. Unk 286 dt<sub>1</sub> was an early dt<sub>1</sub> variety obtained from VR Seeds and given the code name Unknown 286.

The F<sub>1</sub> was grown in the greenhouse in 1975-76 and the F<sub>2</sub> population advanced to the F<sub>3</sub> generation by the Bulk Pedigree Method at Plainview, Texas in 1976.

The F<sub>3</sub> population grown at Plainview, Texas and a single plant called SX-76(e)13 was selected and weighed 57 grams at this location in 1977. This line was put into a preliminary trial (1x25' row). Weight of the plot was 2175 grams compared to Mitchell 450 at 2135 grams in 1978.

Yield was recorded for SX-76(e)13 in 1979, 1980 and 1981. In 1980 the experimental number RAX-24 was assigned to this line.

1979

Plainview, Texas

SX-76(e)13  
 Mitchell

67 lbs. per 400' row  
 65 lbs. per 400' row

1980

Plainview, Texas

Fisher, Arkansas

RAX-24  
 Mitchell

76 lbs. per 100' row  
 76 lbs. per 100' row

24 lbs. per 100' row  
 26 lbs. per 100' row

1980 was also the year of a small increase of this variety. A total of 38 bushels was available for strip trials, state trials, breeders seed etc..

1981

Plainview, Texas

Mascoutah, Illinois

RAX-24  
 Mitchell

74 lbs. per 400' row  
 64 lbs. per 400' row

7 lbs. per 50' row  
 8 lbs. per 50' row

Phytophthora Root Rot screening was conducted by Kansas State University and Perdue University in 1981. These results were as follows:

	Kansas*		Field Tolerance Rating	Indiana *
	Race 1	Race 2		Race 1
RAX-24	R	R	1.0	R
Mitchell	S	S		S

\*See Enclosures

Ph (chlorosis) ratings and shatter score were taken at Plainview, Texas in 1980 and 1981.

	<u>ph (Chlorosis)</u>	<u>Shatter</u>
RAX-24	4.0	1.0
Mitchell	4.5	4.0

Based upon the general trial data shatter scores, phytophthora root rot resistance scores were determined that Mitchell 410 was worthy of release in areas where Mitchell has trouble with shattering and phytophthora root rot. Breeders seed was obtained from a 10 acre increase made in 1981 in Texas. This 10 acre increase was rogued several times for off-types.

Phenotypically the variety Mitchell 410 closely resembles Mitchell. It matures 1  $\pm$  day earlier than Mitchell and may be 1" shorter. The seed resembles Mitchell very closely. Approximately .01% black hilum seed occurs, which is being removed from breeder and foundation seed of Mitchell 410.

Exhibit B  
Novelty Statement

Mitchell 410 greatly resembles its paternal parent Mitchell, both in plant type and seed characteristics. It is different and novel in the following two traits.

- 1) Mitchell is susceptible to race 1 phytophthora.  
Mitchell 410 is resistant to race 1 phytophthora.
- 2) Mitchell is susceptible to shattering in certain weather conditions.  
Mitchell 410 has good seed holding ability under these variable weather conditions i.e.

1.0 vs. 4.0 shatter score in Plainview, Texas.  
(2 years data)

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
LIVESTOCK, MEAT, GRAIN & SEED DIVISION  
PLANT VARIETY PROTECTION OFFICE  
BELTSVILLE, MARYLAND 20705

EXHIBIT C  
(Soybean)

OBJECTIVE DESCRIPTION OF VARIETY  
SOYBEAN (*Glycine max* L.)

NAME OF APPLICANT(S) Zoecon Corporation	TEMPORARY DESIGNATION RAX-24	VARIETY NAME Mitchell 410
ADDRESS (Street and No., or R.F.D. No., City, State, and Zip Code) 975 California Avenue Palo Alto, California 94304		FOR OFFICIAL USE ONLY PVPO NUMBER 8200162

Choose the appropriate response which characterizes the variety in the features described below. When the number of significant digits in your answer is fewer than the number of boxes provided, place a zero in the first box when number is 9 or less (e.g.,  ).

1. SEED SHAPE:



1 = Spherical (L/W, L/T, and T/W ratios = < 1.2)  
3 = Elongate (L/T ratio > 1.2; T/W = < 1.2)

2 = Spherical Flattened (L/W ratio > 1.2; L/T ratio = < 1.2)  
4 = Elongate Flattened (L/T ratio > 1.2; T/W > 1.2)

2. SEED COAT COLOR: (Mature Seed)

1 = Yellow

2 = Green

3 = Brown

4 = Black

5 = Other (Specify) \_\_\_\_\_

3. SEED COAT LUSTER: (Mature Hand Shelled Seed)

1 = Dull ('Corsoy 79'; 'Braxton')

2 = Shiny ('Nebsoy'; 'Gasoy 17')

4. SEED SIZE: (Mature Seed)

Grams per 100 seeds

5. HILUM COLOR: (Mature Seed)

1 = Buff

2 = Yellow

3 = Brown

4 = Gray

5 = Imperfect Black

6 = Black

7 = Other (Specify) \_\_\_\_\_

6. COTYLEDON COLOR: (Mature Seed)

1 = Yellow

2 = Green

7. SEED PROTEIN PEROXIDASE ACTIVITY:

1 = Low

2 = High

8. SEED PROTEIN ELECTROPHORETIC BAND:

1 = Type A (SP1<sup>a</sup>)

2 = Type B (SP1<sup>b</sup>)

9. HYPOCOTYL COLOR:

1 = Green only ('Evans'; 'Davis')

2 = Green with bronze band below cotyledons ('Woodworth'; 'Tracy')

3 = Light Purple below cotyledons ('Beeson'; 'Pickett 71')

4 = Dark Purple extending to unifoliate leaves ('Hodgson'; 'Coker Hampton 266A')

10. LEAFLET SHAPE:

1 = Lanceolate

2 = Oval

3 = Ovate

4 = Other (Specify) \_\_\_\_\_

## 11. LEAFLET SIZE:

☐ 21 = Small ('Amsoy 71'; 'A5312')  
3 = Large ('Crawford'; 'Tracy')

2 = Medium ('Corsoy 79'; 'Gasoy 17')

## 12. LEAF COLOR:

☐ 21 = Light Green ('Weber'; 'York')  
3 = Dark Green ('Gnome'; 'Tracy')

2 = Medium Green ('Corsoy 79'; 'Braxton')

## 13. FLOWER COLOR:

☐ 2

1 = White

2 = Purple

3 = White with purple throat

## 14. POD COLOR:

☐ 1

1 = Tan

2 = Brown

3 = Black

## 15. PLANT PUBESCENCE COLOR:

☐ 2

1 = Gray

2 = Brown (Tawny)

## 16. PLANT TYPES:

☐ 21 = Slender ('Essex'; 'Amsoy 71')  
3 = Bushy ('Gnome'; 'Govan')

2 = Intermediate ('Amcor'; 'Braxton')

## 17. PLANT HABIT:

☐ 3

1 = Determinate ('Gnome'; 'Braxton')

2 = Semi-Determinate ('Will')

3 = Indeterminate ('Nebsoy'; 'Improved Pelican')

## 18. MATURITY GROUP:

☐ 071 = 000  
9 = VI2 = 00  
10 = VII3 = 0  
11 = VIII4 = I  
12 = IX5 = II  
13 = X

6 = III

7 = IV

8 = V

## 19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

## BACTERIAL DISEASES:

☐ 0Bacterial Pustule (*Xanthomonas phaseoli* var. *sojensis*)☐ 0Bacterial Blight (*Pseudomonas glycinea*)☐ 0Wildfire (*Pseudomonas tabaci*)

## FUNGAL DISEASES:

☐ 0Brown Spot (*Septoria glycines*)Frogeye Leaf Spot (*Cercospora sojae*)☐ 0

Race 1

☐

Race 2

☐

Race 3

☐

Race 4

☐

Race 5

☐

Other (Specify)

☐ 0Target Spot (*Corynespora cassicola*)☐ 0Downy Mildew (*Peronospora trifoliorum* var. *manshurica*)☐ 0Powdery Mildew (*Microspheera diffusa*)☐ 0Brown Stem Rot (*Cephalosporium gregatum*)☐ 0Stem Canker (*Diaporthe phaseolorum* var. *caulivora*)



19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant) (Continued)

FUNGAL DISEASES: (Continued)

☐ Pod and Stem Blight (*Diaporthe phaseolorum* var. *sojae*)

☐ Purple Seed Stain (*Cercospora kikuchii*)

☐ Rhizoctonia Root Rot (*Rhizoctonia solani*)

Phytophthora Rot (*Phytophthora megasperma* var. *sojae*)

☐ Race 1    ☐ Race 2    ☐ Race 3    ☐ Race 4    ☐ Race 5    ☐ Race 6    ☐ Race 7

☐ Race 8    ☐ Race 9    ☐ Other (Specify) \_\_\_\_\_

VIRAL DISEASES:

☐ Bud Blight (Tobacco Ringspot Virus)

☐ Yellow Mosaic (Bean Yellow Mosaic Virus)

☐ Cowpea Mosaic (Cowpea Chlorotic Virus)

☐ Pod Mottle (Bean Pod Mottle Virus)

☐ Seed Mottle (Soybean Mosaic Virus)

NEMATODE DISEASES:

Soybean Cyst Nematode (*Heterodera glycines*)

☐ Race 1    ☐ Race 2    ☐ Race 3    ☐ Race 4    ☐ Other (Specify) \_\_\_\_\_

☐ Lance Nematode (*Hoplolaimus Colombus*)

☐ Southern Root Knot Nematode (*Meloidogyne incognita*)

☐ Northern Root Knot Nematode (*Meloidogyne Hapla*)

☐ Peanut Root Knot Nematode (*Meloidogyne arenaria*)

☐ Reniform Nematode (*Rotylenchulus reniformis*)

☐ OTHER DISEASE NOT ON FORM (Specify): \_\_\_\_\_

20. PHYSIOLOGICAL RESPONSES: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

☐ Iron Chlorosis on Calcareous Soil

☐ Other (Specify) \_\_\_\_\_

21. INSECT REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

☐ Mexican Bean Beetle (*Epilachna varivestis*)

☐ Potato Leaf Hopper (*Empoasca fabae*)

☐ Other (Specify) \_\_\_\_\_

22. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED.

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant Shape	Mitchell	Seed Coat Luster	Mitchell
Leaf Shape	Mitchell	Seed Size	Mitchell
Leaf Color	Mitchell	Seed Shape	Mitchell
Leaf Size	Mitchell	Seedling Pigmentation	Mitchell

## 23. GIVE DATA FOR SUBMITTED AND SIMILAR STANDARD VARIETY: Paired Comparison Data

VARIETY	NO. OF DAYS MATURITY	PLANT LODGING SCORE	CM PLANT HEIGHT	LEAFLET SIZE		SEED CONTENT		SEED SIZE G/100 SEEDS	NO. SEEDS/POD
				CM Width	CM Length	% Protein	% Oil		
Submitted	109	1.8	84	-	-	-	-	-	-
Name of Similar Variety	110	1.6	86	-	-	-	-	-	-

## PUBLICATIONS USEFUL AS REFERENCE AIDS FOR COMPLETING THIS FORM:

1. Caldwell, B.E., ed. 1973. Soybeans: Improvement, Production, and Uses. Amer. Soc. Agron. Monograph No. 16.
2. Buttery, B.R. and R.I. Buzzell. 1968. Peroxidase activity in seeds of soybean varieties. Crop Sci., 8: 722-725.
3. Hymowitz, T. 1973. Electrophoretic analysis of SBTI-A<sub>2</sub> in the USDA soybean germplasm collection. Crop Sci., 13: 420-421.
4. Payne, R.C. and L.F. Morris. 1976. Differentiation of soybean cultivars by seedling pigmentation patterns. J. Seed Technol. 1: 1-19.

Exhibit D  
Additional Description of the Variety

Mitchell 410 is high yielding variety in the northern 4 maturity group. It features a medium tall plant with good standability. Leaves are medium green, medium size plant type is indeterminate with good branching and pods tend to be compact along the stems and lateral branches. Four seeded pods occur frequently in good years, less frequently under stress conditions.

The seed is round, medium sized with good seed coat. Seed coat will crack if rain occurs just prior to harvest. Hilum is medium brown in color and medium in size. The brown hilum color has more shades of color due to environmental effects. This causes Mitchell 410 to have shades of brown hilum.

Mitchell 410 will yield well under irrigation in the western areas of Texas, Oklahoma and Kansas. Other areas of adaptation are Northern Missouri, Southern Illinois, Southern Indiana and Northern Kentucky.

Table 16. (continued)

8200102

Brand or entrant	Entry	Maturity group*	Phytophthora Root Rot Reactions Greenhouse Response**									Field response+	Shattering Rating++ Manhattan (two weeks after maturity)
			Races										
			1	2	3	4	5	6	7	8	9		
Rider's PrideKD-60		III	S	S	S	S	S	S	S	S	S	1	2
Rider's PrideKD-70		III	M	M	S	S	S	S	S	S	S	2	2
Ring Around	RAX-21	II	R	R	S	S	S	S	S	S	S	5	2
Ring Around	RA-24	IV	R	R	S	S	S	S	S	S	S	1	1
Ring Around	RA-31	III	R	R	S	S	S	S	S	S	S	1	2
Ring Around	RA-401	IV	S	S	S	S	S	S	S	S	S	2	1
Ring Around	RA-402	IV	R	R	S	S	S	S	S	S	S	-	1
Ring Around	RA-480	V	S	S	S	S	S	S	S	S	S	0	1
Ring Around	Mitchell 450	IV	R	R	S	S	S	S	S	S	S	4	1
S Brand	S48a	II	S	S	S	S	S	S	S	S	S	1	2
S Brand	S48b	II	S	S	S	S	S	S	S	S	S	2	1
S Brand	S51	III	R	R	S	S	S	S	S	S	S	4	3
S Brand	S52a	III	S	S	S	S	S	S	S	S	S	1	1
S Brand	S54	III	S	S	S	S	S	S	S	S	S	2	2
S Brand	S56	III	S	S	S	S	S	S	S	S	S	1	2
S Brand	S60b	III	M	M	S	S	S	S	S	S	S	2	2
S Brand	S62a	III	M	M	S	S	S	S	S	S	S	1	2
S Brand	S64	IV	M	M	S	S	S	S	S	S	S	2	2
S Brand	S68	IV	S	S	S	S	S	S	S	S	S	1	1
SRF	350P	III	R	R	S	S	S	S	S	S	S	1	1
SRF	450	IV	S	S	S	S	S	S	S	S	S	2	1
VR	Baron	III	M	M	S	S	S	S	S	S	S	1	1
VR	3393	III	S	S	S	S	S	S	S	S	S	0	1
VR	Classic I	II	S	S	S	S	S	S	S	S	S	1	1
VR	Delta	IV	S	S	S	S	S	S	S	S	S	1	2
VR	5005 exp.	IV	S	S	S	S	S	S	S	S	S	2	1
VR	8027	V	S	S	S	S	S	S	S	S	S	0	1
Wilson	3130	III	M	M	S	S	S	S	S	S	S	2	2
Wilson	3340	III	M	M	S	S	S	S	S	S	S	4	1
Wilson	3550	III	R	R	S	S	S	S	S	S	S	2	2
Wilson	3860	III	M	M	S	S	S	S	S	S	S	2	1

LSD(.05)=1.5

LSD(.05)=1.5

\* For explanation of maturity groups see Soybean Handbook, Kansas Extension C-449, available in county offices.

\*\* S=susceptible, R=resistant, and M=mixture of resistant and susceptible plants. Reactions to all races were evaluated in the greenhouse.

+ Field responses to Phytophthora root rot were evaluated under irrigation in Pawnee County.  
0=no plants killed, 1=1-9%, 2=10-19%, 3=20-29%, 4=30-39%, and 5=40-50% of the plants killed.

++ 1=no shattering, 2=1-10%, 3=10-25%, 4=25-50%, of pods shattered.

## ASSIGNMENT

### PLANT VARIETY PROTECTION CERTIFICATE

WHEREAS, Ring Around Products, Inc., a Delaware corporation, having a place of business at 12200 Ford Road, Suite 400, Dallas, Texas 75234, hereinafter referred to as "Ring Around", is the duly authorized owner and holder of the entire right, title and interest in and to the following U.S. Plant Variety Protection Certificates and applications for U.S. Plant Variety Certificates (collectively referred to as "Certificates"):

#### Plant Protection Certificates and Applications

<u>Variety</u>	<u>PVP Certificate No.</u>	<u>Date Issued</u>
Mitchell	7300054	10/30/74
RA-526	7500067	12/12/75
RA-501A	76TQ006	5/11/78
RA-401	7800030	6/22/78
RA-601	7800031	6/22/78
RA-480	7900007	2/15/79
RA-604	7900008	3/1/79
Mitchell 450	7900046	6/14/79
RA-402	8000093	7/31/80
RA-481	8000054	3/26/81
RA-680	8100097	4/15/82
RA-502	8200160	8/31/83
RA-403	8200163	10/27/83
Mitchell 410	8200162	10/27/83
RA-606	8200161	10/27/83
RA-580	8300075	4/30/84
RA-405	8500010 (filing number)	10/10/84 (filing date)
RA-451	8500008 (filing number)	10/10/84 (filing date)
RA-452	8500009 (filing number)	10/10/84 (filing date)

WHEREAS, ROHM AND HAAS SEEDS INC., a Delaware corporation, ("RHS") having a place of business at Independence Mall West, Philadelphia, Pennsylvania 19105, is desirous of acquiring the entire interest in the aforementioned varieties, Certificates and the rights associated therewith;

NOW, THEREFORE, in consideration of and in exchange for the sum of one dollar (\$1.00) and other good and valuable consideration, receipt of which is hereby acknowledged, Ring Around does hereby sell, assign, transfer and set over, unto RHS its entire right, title and interest in and to the aforementioned varieties and Certificates.

IN WITNESS WHEREOF, this ASSIGNMENT is entered into as of  
this 21st day of November, 1984.

RING AROUND PRODUCTS, INC.

By Wilbur G. Johnson  
Wilbur G. Johnson  
President

ACKNOWLEDGMENT

STATE OF PENNSYLVANIA     )  
                                      )  
COUNTY OF PHILADELPHIA   )

On November 21, 1984, before me, the undersigned, a  
Notary Public in and for said State and County, personally  
appeared Wilbur G. Johnson, known to me to be the President of  
the Corporation that executed the within instrument, on behalf of  
the corporation herein named, and acknowledged to me that such  
Corporation executed the within instrument pursuant to its  
by-laws or a resolution of its board of directors.

WITNESS my hand and official seal.

Elizabeth A. Smith  
Notary Public

My Commission Expires: Oct. 14, 1985

ELIZABETH A. SMITH  
Notary Public, Phila., Phila. Co.  
My Commission Expires Oct. 14, 1985

ASSIGNMENT

WHEREAS, Rohm and Haas Seeds Inc., a Delaware corporation, with its principal office at Independence Mall West, Philadelphia, Pennsylvania 19105 ("RHS") is the owner of the entire right, title and interest in and to the following soybean varieties, applications for United States Plant Variety Protection Certificates and United States Plant Variety Protection Certificates (collectively referred to as "Certificates"):

<u>Soybean Variety</u>	<u>Certificate Number</u>	<u>Date Issued</u>
Mitchell	7300054	October 30, 1974
RA-401	7800030	June 22, 1978
RA-601	7800031	June 22, 1978
Mitchell 450	7900046	June 14, 1979
RA-481	8000054	March 26, 1981
RA-402	8000093	July 31, 1980
Mitchell 410	8200162	October 27, 1983
RA-403	8200163	October 27, 1983
RA-526	7500067	December 12, 1975
RA-604	7900008	March 1, 1979
RA-680	8100097	April 15, 1982
RA-502	8200160	August 31, 1983
RA-606	8200161	October 27, 1983
RA-580	8300075	April 30, 1984
RA-501 A	76TQ006	May 11, 1978
RA-480	7900007	February 15, 1979

<u>Soybean Variety</u>	<u>Application Number</u>	<u>Filing Date</u>
RA-451	8500008	October 10, 1984
RA-452	8500009	October 10, 1984
RA-405	8500010	October 10, 1984

WHEREAS, CR Seeds, a general partnership, having its principal office at 900 Darlington Highway, Hartsville, South Carolina 29550 ("Partnership") is desirous of acquiring the entire interest in the aforementioned varieties and Certificates;

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, RHM does hereby sell, assign, transfer to the Partnership the entire right, title and interest in and to the varieties and Certificates for its use and benefit and for its successors and assigns.

IN TESTIMONY THEREOF, Rohm and Haas Seeds Inc. intending to be legally bound has caused this assignment to be executed by its duly authorized officer, effective as of the 20th day of December, 1984.

Date:

12/23/85

ROHM AND HAAS SEEDS INC.

By:

Charles H. Baker

Title:

Pres

STATE OF

Penn

:

SS

COUNTY OF

Phila

:

On this 23 day of December, 1985, before me appeared Charles H. Baker of Rohm and Haas Seeds Inc., the person who signed this instrument, who acknowledged that he signed it as a free act on behalf of Rohm and Haas Seeds Inc. with authority to do so.

JOAN B. HENDERSON

Notary Public, Phila., Phila. Co.

Notary Public

My Commission Expires:

My Commission Expires Nov. 29, 1986



ASSIGNMENT

WHEREAS, CR Seeds, a general partnership having its principal office at 900 Darlington Highway, Hartsville, South Carolina 29550 ("Partnership"), is the owner of the entire right, title and interest to the United States Plant Variety Protection Certificates and applications for such Certificates (collectively "Certificates") listed on Appendix A attached hereto;

WHEREAS, the partners of CR Seeds, Rohm and Haas Seeds Inc., a Delaware corporation having its principal office at Independence Mall West, Philadelphia, PA 19105 ("RHS") and Coker's Pedigreed Seed Company, a South Carolina corporation with its principal office at 900 Darlington Highway, Hartsville, SC 29550 ("CPS"), are each desirous of acquiring a one-half undivided interest in the varieties and Certificates listed on Appendix A;

NOW, THEREFOR, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, CR Seeds does hereby sell, assign and transfer to RHS a one-half undivided interest in and to the varieties and Certificates and to CPS a one-half undivided interest in and to the varieties and Certificates for each of their use and benefit and for each of their successors and assigns.

IN TESTIMONY THEREOF, CR Seeds intending to be legally bound has caused this assignment to be executed by its duly authorized officer.

CR Seeds

By: E. Joe Dahmer  
President

State of South Carolina )  
County of Darlington ) SS

On this 30th day of December, 1986, before me appeared E. Joe Dahmer of CR Seeds, the person who signed this instrument who acknowledged that he signed it as a free act on behalf of CR Seeds with authority to do so.

Louis B. Elliott  
Notary Public

My commission expires 4-14-91

APPENDIX A

Soft Red Winter Wheat Varieties

<u>Variety Name</u>	<u>U.S. Plant Variety Certificate No.</u>	<u>Issue Date</u>
Coker 68-15	7200014	Mar. 6, 1974
Coker 68-19	7200015	Mar. 6, 1974
Coker 747	76TQ015	Sept. 9, 1978
Coker 762	8000152	Dec. 12, 1981
Coker 797	8000145	Dec. 12, 1981
Coker 916	8300036	Sept. 27, 1985
Coker 983	8400058 <sup>1</sup>	Feb. 27, 1984 <sup>1</sup>
McNair 701	7200038	Feb. 26, 1974
McNair 4823	7200037	April 8, 1975
RHS 8232	8400136 <sup>1</sup>	July 16, 1984 <sup>1</sup>
9227	8600009 <sup>1</sup>	Oct. 22, 1985 <sup>1</sup>
9323	8600010 <sup>1</sup>	Oct. 22, 1985 <sup>1</sup>

---

1. Application number and filing date.

Winter Oat Varieties

<u>Variety Name</u>	<u>U.S. Plant Variety Certificate No.</u>	<u>Issue Date</u>
Coker 227	7500007	Oct. 20, 1977
Coker 716	7900003	Dec. 28, 1978
Coker 820	8400059 <sup>1</sup>	Feb. 28, 1984 <sup>1</sup>
Coker 234	7500008	Oct. 26, 1977
Four Twenty Two	7700085	Apr. 12, 1979
Big Mac	8200121	Aug. 19, 1982
Mesquite	8200122	Aug. 19, 1982

---

1. Application number and filing date.

Soybean Varieties

Coker Hampton 266A	7100022	Sept. 6, 1973
Coker 136	7300091	Oct. 18, 1973
Coker 338	7400058	Oct. 29, 1976
Coker 237	7800034	July 13, 1978
Coker 488	7800035	July 13, 1978
Coker 156	7900043	Nov. 27, 1979
Coker 317	8100095	Nov. 19, 1981
Coker 368	8200140	Aug. 31, 1983
Coker 425	8400077	May 31, 1985
Coker 485	8400078	May 31, 1985
Coker 393 (Q327-4270)	8400018	Jan. 25, 1985
Coker 355 (XP5878)	8400019	Jan. 25, 1985
Coker 627	8700001 <sup>1</sup>	Oct. 3, 1986 <sup>1</sup>
Coker 686	Pending <sup>1</sup>	Dec. 19, 1986

---

1. Application number and filing date.

<u>Variety Name</u>	<u>U.S. Plant Variety Certificate No.</u>	<u>Issue Date</u>
AP55	8100089	Feb. 18, 1982
AP70	7800081	Feb. 15, 1979
AP71	8100090	Sept. 24, 1981
Lancer	7600044	Sept. 29, 1976
RA-526	7500067	Dec. 12, 1975
RA-604	7900008	Mar. 1, 1975
RA-680	8100097	Apr. 15, 1982
RA-502	8200160	Aug. 31, 1983
RA-606	8200161	Oct. 27, 1983
RA-580	8300075	Apr. 30, 1984
Mitchell	7300054	Oct. 30, 1974
RA-401	7800030	June 22, 1978
RA-601	7800031	June 22, 1978
Mitchell 450	7900046	June 14, 1979
RA-481	8000054	Mar. 26, 1981
RA-402	8000093	July 31, 1981
Mitchell 410	8200162	Oct. 27, 1983
RA-403	8200163	Oct. 27, 1983

<u>Variety Name</u>	<u>Certificate No.</u>	<u>Issue Date</u>
RA-451	8500008 <sup>1</sup>	Oct. 10, 1984 <sup>1</sup>
RA-452	8500009 <sup>1</sup>	Oct. 10, 1984 <sup>1</sup>
RA-405	8500010 <sup>1</sup>	Oct. 10, 1984 <sup>1</sup>
RA-501 A	76TQ006	May 11, 1978
RA-480	7900007	Feb. 15, 1979

---

1. Application number and filing date.

ASSIGNMENT

WHEREAS, Rohm and Haas Seeds Inc., a Delaware corporation having its principal office at Independence Mall West, Philadelphia, PA 19105 ("RHS"), is the owner of a one-half undivided interest in and to the United States Plant Variety Protection Certificates and applications for such Certificates (collectively "Certificates") listed on Appendix A attached hereto:

WHEREAS, Coker's Pedigreed Seed Company, a South Carolina corporation with its principal office at 900 Darlington Highway, Hartsville, SC 29550 ("CPS"), is desirous of acquiring this one-half undivided interest in the aforementioned varieties and Certificates;

NOW, THEREFOR, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, RHS does hereby sell, assign and transfer to CPS RHS's one-half undivided interest in and to the varieties and Certificates for CPS's use and benefit and for its successors and assigns.

IN TESTIMONY THEREOF, RHS intending to be legally bound has caused this assignment to be executed by its duly authorized officer.

ROHM AND HAAS SEEDS INC.

By: Howard A. Mergelkamp

Assistant Treasurer

State of Pennsylvania )  
County of Philadelphia ) SS

On this 31<sup>st</sup> day of December, 1986, before me appeared Howard A. Mergelkamp of Rohm and Haas Seeds Inc., the person who signed this instrument who acknowledged that he signed it as a free act on behalf of Rohm and Haas Seeds Inc. with authority to do so.

Elizabeth A. Smith

ELIZABETH A. SMITH, Notary Public

Notary Public, Phila., Phila. Co.

My commission expires

My Commission Expires Oct. 14, 1989

ASSIGNMENT OF PLANT VARIETY PROTECTION CERTIFICATES

WHEREAS, COKER'S PEDIGREED SEED COMPANY, a South Carolina corporation ("Coker's"), having its offices at 900 Darlington Highway, Hartsville, South Carolina 29550, has adopted and used and is the sole and exclusive owner of certain United States Plant Variety Protection Certificates and similar rights under laws of countries other than the United States as listed in Exhibit A hereto:

WHEREAS, COKER'S PEDIGREED SEED CO. and NORTHRUP KING CO., a Delaware corporation ("NK"), have entered into an Asset Purchase Agreement, dated July 20, 1988, providing for the purchase and sale of substantially all of the assets and business of Coker's and the assumption of certain of Coker's liabilities and obligations by NK; and


WHEREAS, NK desires to acquire the right, title and interest in, to and under the Plant Variety Protection Certificates listed on Exhibit A hereto and the pending applications hereto (collectively, the "Plant Variety Protection Certificates").



IN WITNESS WHEREOF, Coker's has caused this instrument to be executed by its duly authorized representative as of the 20th day of July, 1988.

By: E. Joe Dahmer  
E. Joe Dahmer  
President

On this 20<sup>th</sup> day of July, 1988, before me, a Notary Public in and for the County aforesaid, the undersigned officer, E. Joe Dahmer, personally appeared and acknowledged himself to be the President of Coker's Pedigreed Seed Co., and that he executed the foregoing instrument for the purposes therein.

 **TIMOTHY M. BANGASSER**  
NOTARY PUBLIC — MINNESOTA  
**HENNEPIN COUNTY**  
My Commission Expires May 22, 1992

Trish M. Bagnasser  
Notary Public

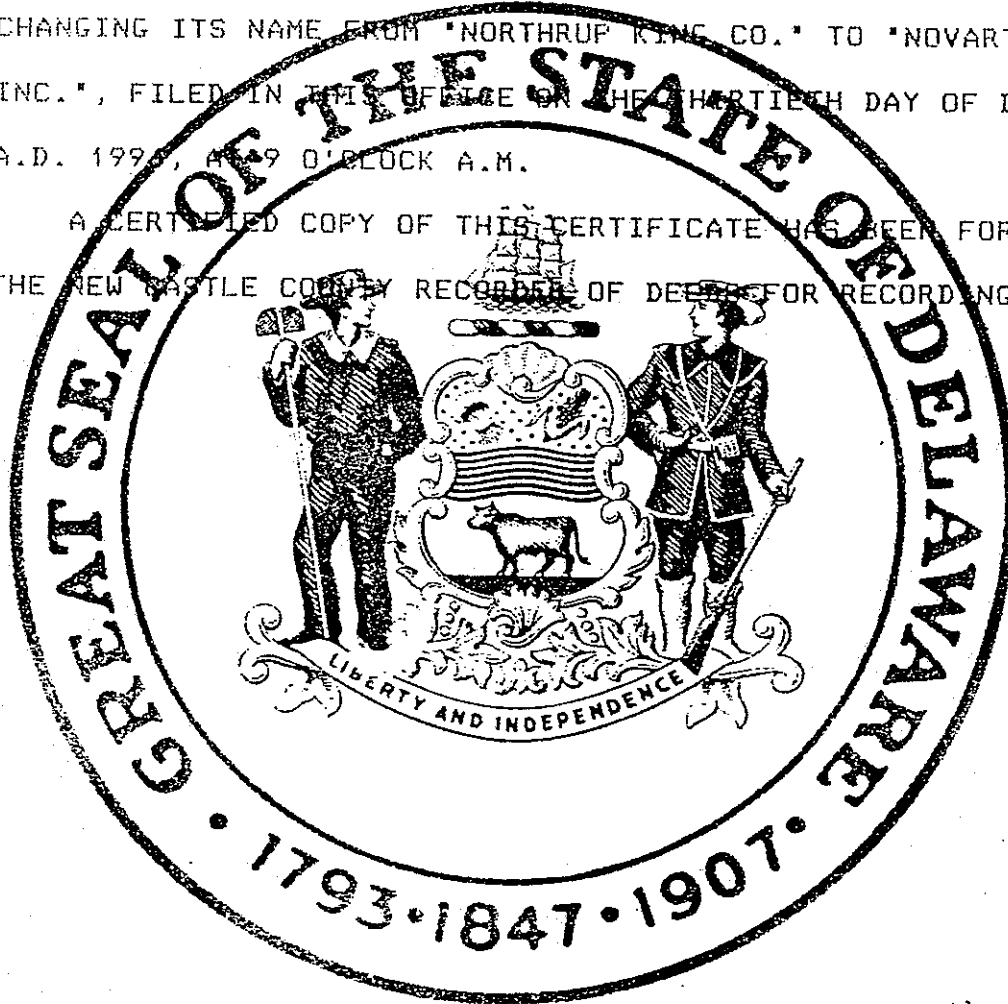
Soybean Varieties, Continued

<u>Variety Name</u>	<u>U.S. Plant Variety Certificate Number</u>	<u>Issue Date</u>	<u>Term (Yrs.)</u>
AP55	8100089	Feb. 18, 1982	18
AP70	7800081	Feb. 15, 1979	17
AP71	8100090	Sept. 24, 1981	18
Lancer	7600044	Sept. 29, 1976	17
RA-526	7500067	Dec. 12, 1975	17
RA-604	7900008	Mar. 1, 1975	17
RA-680	8100097	Apr. 15, 1982	18
RA-502	8200160	Aug. 31, 1983	18
RA-606	8200161	Oct. 27, 1983	18
RA-580	8300075	Apr. 30, 1984	18
Mitchell	7300054	Oct. 30, 1974	17
Ra-401	7800030	June 22, 1978	17
RA-601	7800031	June 22, 1978	17
Mitchell 450	7900046	June 14, 1979	17
RA-481	8000054	Mar. 26, 1981	18
RA-402	8000093	July 31, 1980	17
Mitchell 410	8200162	Oct. 27, 1983	18
RA-403	8200163	Oct. 27, 1983	18
RA-451	8500008	Dec. 27, 1985	18
RA-452	8500009	Aug. 30, 1985	18
RA-405	8500010	Aug. 30, 1985	18
RA-501A	76T0006	May 11, 1978	17
RA-480	7900007	Feb. 15, 1979	17

# Office of the Secretary of State

I, EDWARD J. FREEL, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF AMENDMENT OF "NORTHRUP KING CO.", CHANGING ITS NAME FROM "NORTHRUP KING CO." TO "NOVARTIS SEEDS, INC.", FILED IN THIS OFFICE ON THE THIRTIETH DAY OF DECEMBER, A.D. 1996, AT 9 O'CLOCK A.M.

A CERTIFIED COPY OF THIS CERTIFICATE HAS BEEN FORWARDED TO THE NEW CASTLE COUNTY RECORDER OF DEEDS FOR RECORDING.



*Edward J. Freel*

Edward J. Freel, Secretary of State

0829320 8100

960389892

AUTHENTICATION:

8267947

DATE:

12-31-96

CERTIFICATE OF AMENDMENT OF CERTIFICATE OF INCORPORATION  
OF  
NORTHROP KING CO.

It is certified that:

1. The name of the corporation (hereinafter called the "Corporation") is Northrup King Co.

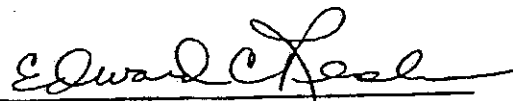
2. The Certificate of Incorporation of the Corporation is hereby amended by striking out Section 1 thereof and by substituting in lieu of said Section the following new Section.

1. The name of the Corporation is Novartis Seeds, Inc.

3. The amendment of the certificate of incorporation herein certified has been duly adopted and written consent has been given in accordance with the provisions of Sections 228 and 242 of the General Corporation Law of the State of Delaware.

4. The effective date of the amendment herein certified shall be January 1, 1997.

Signed on December 27, 1996.



Edward C. Resler  
Vice President & Secretary